U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: INFORMATION:, Equivalent Level of Safety Finding (ELOS) for Bombardier Aerospace Model BD-100-1A10 TC2500NY-T

Date: 5 February, 2003

Reg Ref § 25.1203(a)

From: Manager, Transport Airplane Directorate, Propulsion/Mechanical Systems, ANM-112

Reply to Attn. of: Kevin Dowling ANE-170

To: Manager, New York ACO

ELOS Memo # TC2500NY-T-P-3

The purpose of this memorandum is to inform the certificate management certification office of an evaluation made by the Transport Airplane Directorate on the establishment of an equivalent level of safety finding for the Bombardier Aerospace model BD-100-1A10 Challenger 300.

Background

The Bombardier Model BD-100-1A10 Continental aircraft is powered by two Honeywell AS907 turbofan engines mounted in the rear fuselage. Bombardier has indicated that the AS907 will not incorporate a fire detection system in the engine thrust reverser zone. The thrust reverser zone is considered a fire zone, and therefore would normally require a fire detection system in accordance with § 25.1203.

Paragraph 25.1203(a) states that "(t)here must be approved, quick acting fire or overheat detectors in each designated fire zone, and in the combustion, turbine, and tailpipe sections of turbine engine installations, in numbers and locations ensuring prompt detection of fire in those zones."

Applicable Regulations

§§ 21.21(b)(1), 25.1203, and 25.1207

Regulation(s) Requiring an ELOS

§ 25.1203(a)

Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations, or equipment needed for equivalency)

Bombardier Aerospace intends to provide an equivalent level of safety to the requirement of FAR § 25.1203, based on substantiating, by analysis, the following aspects of the design:

- Low propensity of ignition of skydrol
- Small volume of skydrol present in zone
- Low heating value of skydrol
- Isolation of fluid in all flight conditions
- Adequate ventilation and drainage of zone in excess of the requirements of FAR § 25.1187
- Isolation of the zone with fireproof boundaries and lack of combustible material within the zone

Explanation of how design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation

The Thrust Reverser zone aft of the engine firewall contains hydraulic fluid lines which are normally nonflowing except when the Thrust Reverser is being deployed or stowed on ground. The plausible ignition source comes from wiring and switches, which can only be considered as such in failure conditions. This zone will comply with the drainage and ventilation requirements of FAR § 25.1187. The skin temperature of the duct itself will not reach a temperature to be considered an ignition source.

FAA approval and documentation of the ELOS

The FAA has approved the aforementioned Equivalent Level of Safety Finding addressed in issue paper P-3. This memorandum provides standardized documentation of the ELOS that is non-proprietary and can be made available to the public. The Transport Airplane Directorate has assigned a unique ELOS Memorandum number to facilitate archiving and retrieval of this ELOS. This number should be listed in the Type Certificate Data Sheet in the Certification Basis section as a statement for a TC or ATC project or on page 3 of the STC for an STC project. An example of an appropriate statement is provided below.

Equivalent Safety Findings have been made for the following regulation(s):
§ 25.1203(a) Fire Detector System (documented in TAD ELOS Memo TC2500NY-T-P-3)

/s/Neil Schalekamp	February 11, 2003
Manager, Propulsion and Mechanical Systems Branch, ANM-112	Date

ELOS Originated by New York ACO:	Project Engineer: James Delisio	Routing Symbol ANE-171